

Risk factors for Sporadic *Escherichia coli* O157 Infections in the United States: a Case-control Study in FoodNet Sites, 1999-2000

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Background: *Escherichia coli* O157 (*E. coli* O157) infections can cause severe gastrointestinal illness, characterized by abdominal cramps and profuse, often bloody, diarrhea. In the United States, *E. coli* O157 infections cause an estimated 62,000 foodborne illnesses, 1,800 hospitalizations and 50 deaths each year. To identify new risk factors for illness and collect more information on previously identified risk factors, we conducted a matched case-control study of sporadic *E. coli* O157 infections in 1999-2000.

Methods: Culture-confirmed *E. coli* O157 cases were identified through active laboratory surveillance in 7 sites (California, Connecticut, Georgia, Minnesota, Maryland, New York, Oregon) as part of the CDC's Foodborne Diseases Active Surveillance Network (FoodNet). Age-matched controls were interviewed for each case within 7 days of the matched-case interview. Interviews were conducted by telephone using sequential digit dialing and a standardized questionnaire. Information was collected on demographics, clinical illness, and exposures (e.g., food, water, animal contact) in the 7 days before the case's onset.

Results: Between February 1999 and April 2000, 326 cases and 591 matched controls were enrolled. In preliminary univariate analysis, infection was associated with eating pink hamburgers in the home (mOR=2.2, 95% CI= 1.2-4.3), thawing ground beef in microwave (mOR=1.5, 95% CI= 1.0-2.2), swimming in a pond, lake, river, or stream with cattle nearby (mOR=15.8, 95% CI=1.9-127.7), drinking pond, lake, river or stream water (mOR=3.5, 95% CI= 1.6-7.6), drinking from water fountains or pool water (mOR=3.5, 95% CI= 1.5-8.2), living on a farm (mOR=1.9, 95% CI= 1.1-3.4), and visiting a farm <12 times a year (mOR=3.0, 95% CI= 1.1-8.5). Consumption of ground turkey, pork chops or roast pork, organic produce, bottled water, or any of 12 produce items (romaine lettuce, red leaf lettuce, raw cabbage, onions, broccoli, carrots, cantaloupe, honeydew, strawberries, watermelon, apples, parsley, cilantro) had odds ratios of less than one.

Conclusions: Preliminary analysis indicates undercooked ground beef, surface waters, and farms continue to be sources of sporadic *E. coli* O157 infections in the United States. However, unlike previous case-control studies, infections were not associated with restaurant consumption of undercooked ground beef, possibly reflecting improvements in restaurant handling of ground beef or changes in eating habits. Consumption of several produce items was negatively associated with *E. coli* O157 infections. Final interpretation awaits multivariate analysis.

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